# Trout Lake Boreal Caribou Study Progress Report, February 2006

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## Background

In response to the new federal Species at Risk Act (SARA) and following extensive consultation with the Sambaa K'e Dene Band (SKDB) membership of Trout Lake, the Department of Environment and Natural Resources (ENR), Dehcho Region initiated an ecological study of boreal caribou in the Trout Lake area during spring 2004. With limited scientific knowledge about boreal caribou in the area, SKDB saw the benefits of combining information from this study with their own traditional knowledge study to fill knowledge gaps in traditional information. Ten female boreal caribou were collared in the Celibeta Lake area (Fig. 1, area A) in order to document seasonal range use and movements, calving period and areas, and fidelity of seasonal range use and movements over a 4-5 year period. Collared females would also provide information on calf production, calf survival, and adult female survival (Larter and Allaire 2005). Other ecological studies of boreal caribou are being conducted in this and other regions of the Northwest Territories to increase our knowledge of boreal caribou so that in the face of increasing development pressures informed decisions regarding land use can be made.

Because caribou collared in 2004 were not distributed throughout the Trout Lake traditional harvesting area (crusty snow conditions restricted caribou distribution), at the request of SKDB an additional 8 satellite collars were deployed on female boreal caribou in other areas to the north and east of Trout Lake in spring 2005 (Fig. 1, Area B). The information provided from animals in the Trainor Lake area could also be used by SKDB for their area of interest as a Protected Area.

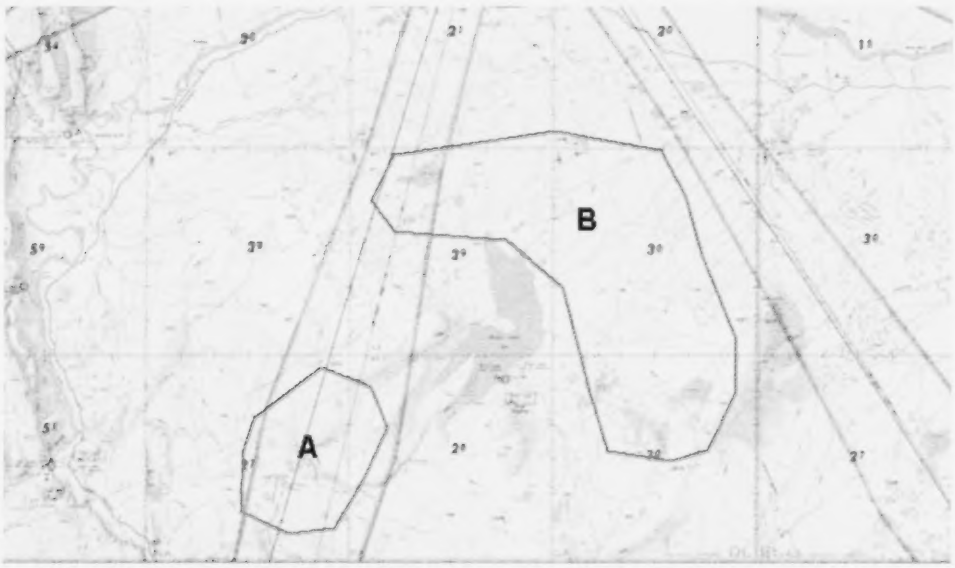


Figure 1. The areas where collars were deployed on female boreal caribou; 10 in area A spring 2004, 8 in area B spring 2005.

## Satellite Collar Descriptions and Deployment

We deployed the same Telonics ST-20 collars in spring 2005 as in 2004 except that the collars deployed in 2005 were equipped with a release mechanism. Collars were programmed to release in March 2009. Collars were the preferred teardrop design with both a satellite (blue arrow) and a VHF (**black** arrow) transmitting beacon (Fig. 2). The collars deployed in March 2005 began satellite transmissions on 1 April 2005 and had the same duty cycle as the collars deployed in spring 2004: daily locations from 1 May to 14 June and locations once every 3 days for the remainder of the year.

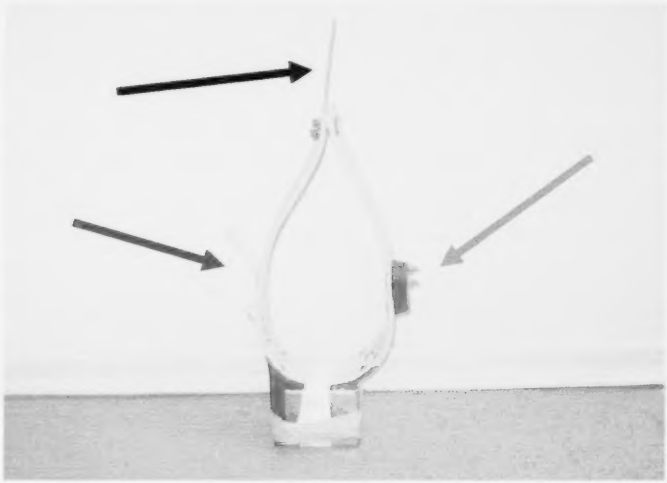

Figure 2. Telonics ST-20 satellite collar teardrop design with a release mechanism (right red arrow), a satellite beacon (left blue arrow) and a VHF beacon (top black arrow).

Caribou were captured by net-gunning them from a helicopter. ENR contracted a professional net-gunning crew to do the work. The crew had to follow strict animal care guidelines during the operation. Blood and fecal samples and an ear plug were collected from each captured animal as long as the opportunity presented itself. Handling times were kept to a minimum, handlers wore rubber gloves. Immediately prior to the deployment of the satellite collars we made a reconnaissance flight in a fixed-wing aircraft to locate animals that could potentially be collared and to direct the capture crew in as efficient a manner as possible. Snow conditions were ideal for the capture as the deeper snow restricted movements. The 8 caribou were collared in different parts of the study area on 3 and 5 March 2005 (Fig. 3).

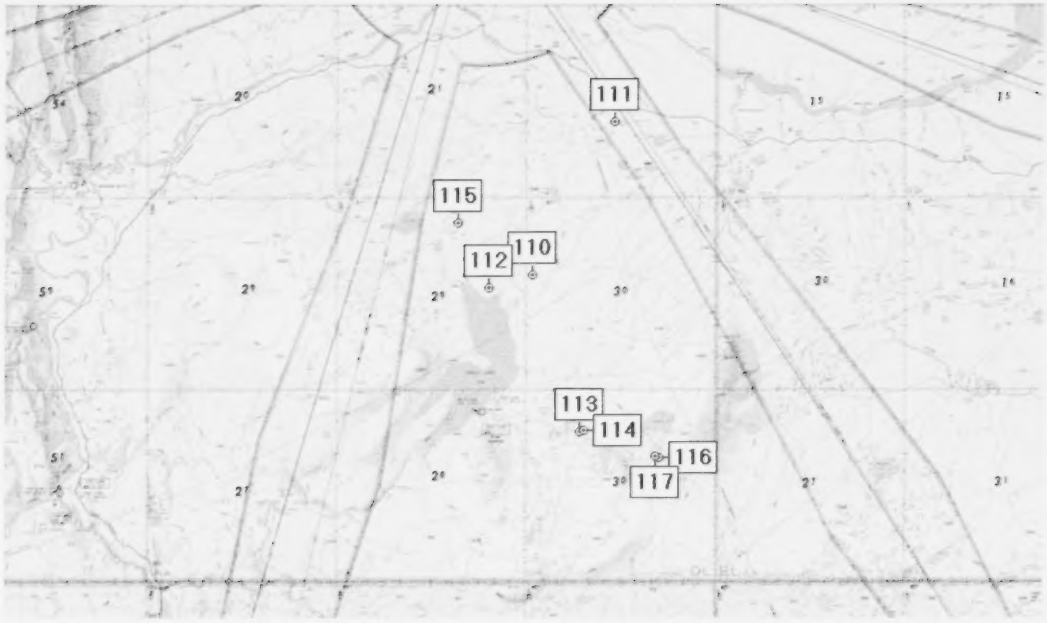


Figure 3. The locations of female boreal caribou collared on 3 and 5 March 2005.

**Relocation Flights**

Two relocation flights with a fixed-wing aircraft are planned annually, one post-calving (late May-early June) and one in late fall (late-September). These flights are made to determine how many collared female caribou had calved and whether the calves survived through the fall. Flight time over the animals is kept to a minimum. We photograph the groups to verify the presence of calves. Additional flights would be made if and when we had indication that collars were stationary for an extended period of time or we had an indication of collar malfunction. Relocation flights were made primarily with a Cessna 172 fixed-wing aircraft, sometimes a Bell 206B helicopter, and were dependent upon aircraft availability and suitable weather conditions for flying. Retrieving downed collars generally required helicopter support. The following is a brief description of flights taken since spring 2005.

- On 10 April we picked up two observers from Trout Lake, David and Tony Jumbo, to check on the 4 newly collared animals in the Tetcho Lake area and a stationary collar (#107) near Celibeta Lake; it was a mortaility. A rotary aircraft was used to pinpoint the collar location (still under snow).
- On 4 May we used a rotary aircraft to check on animals in the Celibeta Lake area, 2 had been stationary. We retrieved collars from these 2 mortalities, #103, #104 and from #107. #104 had an almost intact carcass, very worn teeth and likely died of old age. Evidence with the 2 other collars indicated that they had likely been killed by wolves. Teeth were retrieved from #103, age 5 years 11 months and #104 age 11 years 11 months.

- On 10 June we did a post-calving flight with fixed-wing aircraft. We were unable to get visual observations on a number of animals.
- On 19 June we were able to access some time with a forestry rotary aircraft to check on some of the animals not observed on the 10 June flight.
- On 29 July we retrieved a collar from #110. The animal had been stationary and appeared to have been killed by wolves. We retrieved the teeth, aged 17 years. We used a rotary aircraft that was completing forestry tower servicing in the vicinity of the downed collar.
- On 23 September we did a late-fall flight with fixed-wing aircraft. We had limited success on visual observations because a number of animals were in heavily forested areas.
- On 5 October we used a rotary aircraft to check on a stationary collar #113 and on animals we had not observed on the 23 September flight. We picked up an observer, Victor Jumbo, from Trout Lake to assist us in retrieving the collar. We were unable to retrieve any teeth from this apparent wolf kill.

**Preliminary Findings**

Boreal caribou continue to utilize areas of heavy and tall timber during the snow free seasons and when not in the heavily treed areas their pelage blends in well with the vegetation. The extreme difficulty in getting visual observations from fixed-wing aircraft necessitated extra relocation flights with rotary aircraft. Our data on calf production and calf survival through summer is still limited. Of 13 collared female caribou entering the calving season we know one was not pregnant based upon a blood test. Seven of the remaining 12 collared females (58%) had calves. Two of those 7 calves were lost before 23 September (71% survived till fall); one was lost in June. Based upon observations from the January 2006 capture operation we know that animals #116 and #117 still had calves at heel. The much greater success rate in getting visual observations during winter when groups are larger provides an opportunity to conduct aerial sex/age class counts of enough animals to estimate the ratio of calves to females present in late-winter. Our first class count is scheduled for March 2006.

*Mortalities*

A number of collared caribou have died since we initiated this study. Of the 10 animals captured in March/April 2004, 5 have died (#'s 101, 102, 103, 104, and 107). Of the 8 animals captured in March 2005, 2 have died (#'s 110 and 113). There is strong evidence to suggest that all but one of the mortalities were caused by wolf predation. The remaining animal appears to have died of old age. Six of the 7 mortalities occurred between mid-April and mid-June. The majority of female mortalities in the Cameron Hills study area have also occurred during the pre-calving and calving period (D. Johnson pers. comm.). The other mortality occurred in September.

We retrieved teeth from 4 of the 7 mortalities, most of these caribou were older than expected. The youngest animal (#103) died at age 5 years and 11 months. The animal we suspect died of old age (#104) died at age 11 years and 11 months. The remaining 2 died at age 14 years 11 months (#101) and 17 years 1 month (#110). Two caribou that died in the Ebbutt Hills study area were aged 10 years 9 months and 15 years. Ages were determined at Matson's Laboratory and are based upon counting cementum annuli on teeth, similar to counting the rings of a tree. 1 June is used as the birth date for caribou (Matson 1981). Of note is that blood tests indicated that animals #101, 104, and 110 were pregnant when they were initially captured.

Although the Trout Lake study area is considered relatively pristine, the Dehcho Land Use Plan (DLUP) indicates a noticeable linear footprint on the landscape. Of the six predator related mortalities 2 occurred <100m from a linear feature, 2 occurred 300-350m from a linear feature, and 2 occurred 1.7-2.3km from a linear feature. The animal that died of old age died 200m from the nearest linear feature. These distances are all based upon the location of the collar in relation to the digital DLUP linear footprint.

*Annual Ranges and Range Use*

We estimated the annual home range (1 May 2004 to 30 April 2005) of 8 animals collared in March/April 2004 using the minimum convex polygon estimator; mean annual home range was 1339km$^2$ (range 441-2039km$^2$). The range of 4 animals included NE British Columbia in between two major areas of oil and gas development (Fig. 4). The sizes of range for these animals are similar to those from a Cameron Hills study (D. Johnson pers. comm.) but somewhat smaller than those reported for the Inuvik region (Nagy et al 2005). Contrastingly, the average estimated range (9 March 2005 to 31 January 2006) of 6 animals collared in March 2005 was 1910km$^2$ (range 909-3563km$^2$; Fig. 5). This is likely an underestimate of the annual range and the range size for these animals is more similar to the annual range of caribou in the Inuvik region (Nagy et al 2005). The ranges of 2 of these animals also included NE British Columbia but to the east of the major oil and gas development.

*Calving Areas and Calving Fidelity*

For a second year there was no indication of a common calving area or congregation of females for calving as reported elsewhere (Nagy et al 2005, Larter and Allaire 2006, D. Johnson pers. comm.). Collared females were widely dispersed throughout the area during calving and were found in small groups of 1 or 2 animals with or without calves. The 5 collared females that have been monitored through 2 successive calving periods have shown fidelity to their calving areas. We determined the minimum convex polygon of daily locations during the calving period (1 May-15 June) for each year. We found overlap for all females ranging from 26-90% (Fig. 6). Our preliminary findings, and those from the South Slave (D. Johnson pers. comm.) indicate a greater amount of fidelity to calving areas than found for caribou in the Inuvik region (J. Nagy pers. comm.).

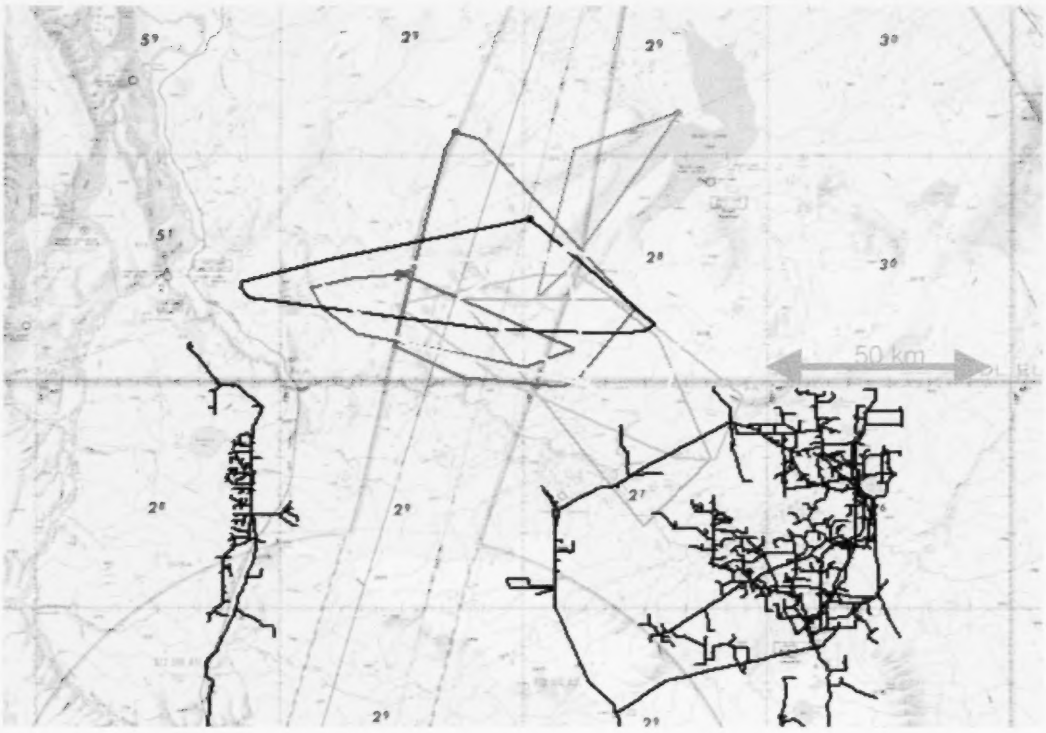


Figure 4. Minimum convex polygon estimates of annual home range for 8 collared female boreal caribou (1 May 2004 to 30 April 2005). The NT-BC border is indicated in dark brown. The black lines are digitized oil and gas developments, Shehah pipeline to the west and Duke Energy to the east.

*Movements and Group Size*

Similar to what we reported last year (Larter and Allaire 2005) and found elsewhere (Nagy et al 2005, D. Johnson pers. comm.) during 1 May - 15 June (Calving/post-calving period) female boreal caribou do not move around very much and are found in groups of small size. The pattern of limited movement and small group size continues through the summer (16 June - 31 August), although for some caribou they spend the summer in a different part of their annual home range from where they spend the calving/post-calving period. Group size increased in the fall and rut (1 September - 15 October), and males and females join together in groups. The distance between 3 day locations also increased during this time of the year. Group size was at its largest during winter (16 October - 30 April), with groups of 10-15 often being seen. The distance between 3 day locations was also greatest during winter. It was not unusual to have minimum straight line distances of 20km between successive locations. This was somewhat surprising with the deep snow conditions throughout the study area during winter 2004-05. Snow cover in the study area has been much lower so far during winter 2005-06, but there does not appear to be any change in minimum straight line distances between successive locations when compared to the previous winter.

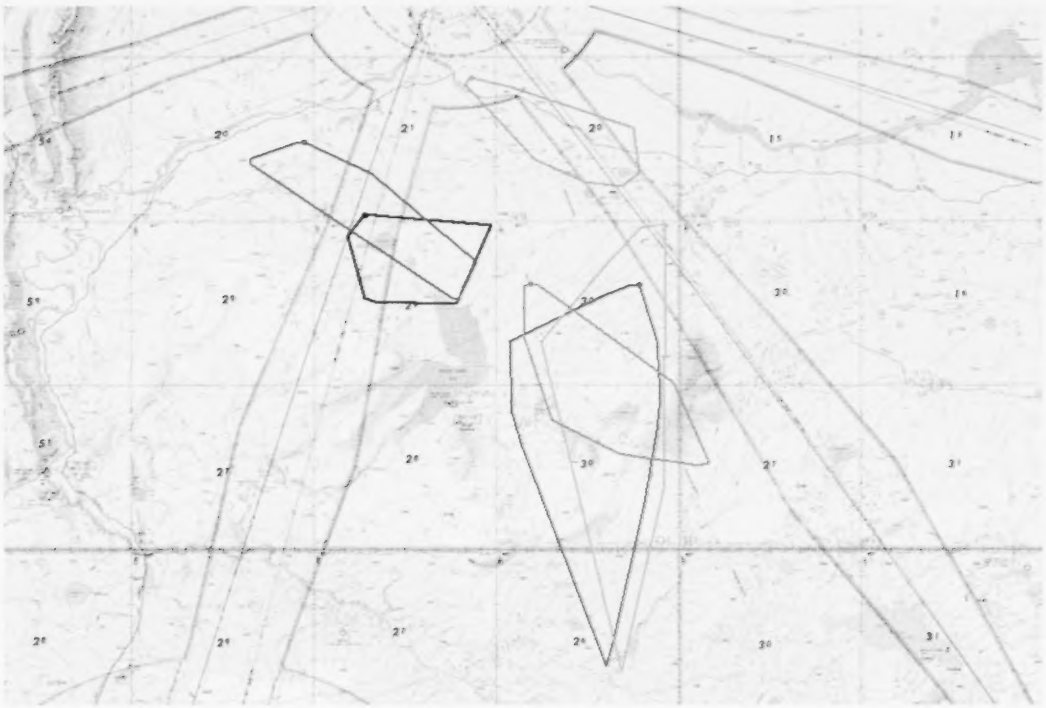

Figure 5. Minimum convex polygon estimates of the range of 6 collared female boreal caribou from 9 March 2005 to 31 January 2006.

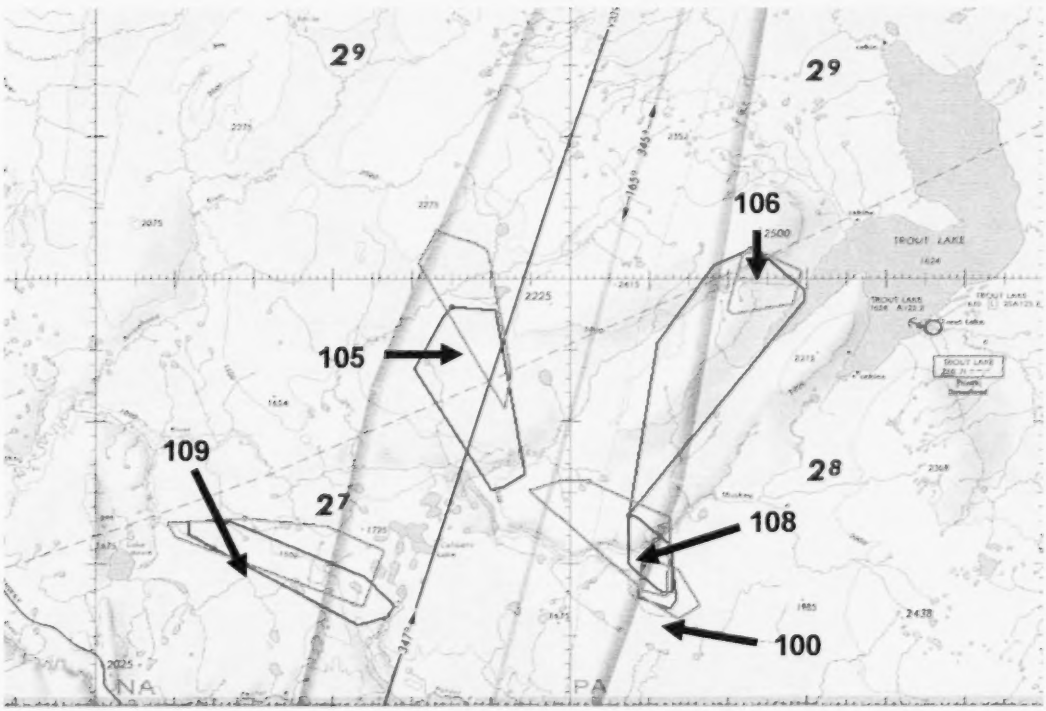


Figure 6. Minimum convex polygons of the calving areas used by female collared boreal caribou. Red outlines the 2004 range, blue outlines the 2005 range.

With the continued monitoring of satellite collared female boreal caribou in the Trout Lake study area we hope to be able to see if caribou use the area differently in winters when snow is deep (2004-05) or snow is not deep (2005-06). With the recent burns (summer 2004) to the east of Trout Lake, continued monitoring of collared caribou should provide information on whether caribou use or avoid recently burnt areas or if this use/avoidance has a seasonal component.

We realize that with the higher number of mortalities than anticipated in this study area there is a need to deploy additional collars in order to maintain an adequate number of collared caribou. Four more satellite collars were deployed on 20 January, 2006 in locations specified by Sambaa K'e Dene Band. Two of the collars deployed in March/April 2004 have not been providing consistent satellite transmissions during part of the winter. We have been working with the manufacturing company to try and determine the cause(s) and rectify the situation. Recently, the problem seems to have gone away as we are again receiving consistent transmissions.

**References**

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Matson, GM. 1981. Workbook for cementum analysis. Milltown, MT.

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**Personal Communications**

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John Nagy, Senior Wildlife Researcher, Mackenzie Valley Development, Inuvik, ENR

A time line of each collared caribou since 2004.

Animal # 100

- 29 March/04 collared
- 29 May/04 seen in group of 3 (no calf)
- 3 June/04 seen alone (no calf)
- 22 September/04 no visual
- 25 January/05 seen in group of 11, no calf
- 31 May/05 seen in group of 3 with calf
- 19 June/05 seen alone (no calf)
- 23 September/05 a problem with VHF reception

Animal # 101

- 30 March/04 collared
- Died during month of May/04, likely wolf predation
- 9 August/04 collar retrieved

Animal #102

- 29 March/04 collared
- Died 14-15 May/04, wolf predation
- 3 June/04 collar retrieved

Animal #103

- 1 April/04 collared
- 29 May/04 seen in group of 3 with calf
- 3 June/04 not checked on
- 22 September/04 no visual
- 25 January/05 not checked on
- Died 25-30 April/05, likely wolf predation
- 4 May/05 collar retrieved

Animal #104

- 29 March/04 collared
- 29 May/04 seen in group of 3 (no calf)
- 3 June/04 seen in group of 3 (no calf)
- 22 September/04 no visual
- 25 January/05 not checked on
- Died 19-27 April/05, death probably related to old age
- 4 May/05 collar retrieved

Animal #105

- 30 March/04 collared
- 29 May seen in group of 3 with calf
- 3 June/04 not checked on
- 22 September/04 no visual
- 25 January/05 seen in group of 3 (no calf)
- 31 May/05 seen alone (no calf)
- 19 June/05 seen alone (no calf)
- 23 September/05 no visual

Animal #106

- 30 March/04 collared
- 29 May/04 no visual
- 3 June/04 seen in group of 2 with calf
- 22 September/04 seen in group of 7 (no calf)
- 25 January/05 seen in group of 5 (no calf)
- 31 May/05 seen alone (no calf)
- 23 September/05 seen in group of 2 (no calf)

Animal #107

- 1 April/04 collared
- 29 May/04 no visual
- 3 June/04 not checked
- 22 September/04 seen in group of 3 with calf
- 25 January/05 not checked
- Died 14-17 April/05 likely wolf predation
- 4 May/05 collar retrieved

Animal #108

- 1 April/04 collared
- 29 May/04 seen alone (no calf)
- 3 June/04 no visual
- 22 September/04 seen in group of 3 (no calf)
- 25 January/05 seen in group of 4 (no calf)
- 31 May/05 no visual
- 10 June/05 no visual
- 19 June/05 seen with calf
- 23 September/05 no visual
- 5 October/05 seen in group of 5 with calf

Animal #109

- 1 April/04 collared
- 29 May/04 no visual
- 3 June/04 not checked on
- 22 September/04 seen in group of 4 (no calf)
- 25 January/05 not checked on
- 31 May/05 seen with calf
- 19 June/05 seen with calf
- 23 September/05 no visual
- 5 October/05 seen in group of 3 with calf

Animal #110

- 5 March/05 collared
- 10 April/05 not checked on
- 5 May/05 seen alone (no calf)
- 31 May/05 seen alone (no calf)
- 10 June/05 not checked on
- Died 5-11 June/05 likely wolf predation
- 29 July/05 collar retrieved

Animal #111

- 3 March/05 collared
- 10 April/05 not checked on
- 5 May/05 seen in group of 2
- 31 May/05 seen with calf
- 10 June/05 not checked on
- 23 September/05 seen in group of 5 with calf
- 5 October/05 not checked on

Animal #112

- 3 March/05 collared
- 10 April/05 seen with calf
- 5 May/05 not checked on
- 31 May/05 seen with calf
- 10 June/05 seen with calf
- 23 September/05 no visual
- 5 October/05 not checked on

Animal #113

- 3 March/05 collared
- 10 April/05 seen in group of 4
- 5 May/05 not checked on
- 31 May/05 no visual
- 10 June/05 seen alone (no calf)
- Died 2-8 September/05 likely wolf predation
- 5 October/05 collar retrieved

Animal #114

- 3 March/05 collared
- 10 April/05 seen in group of 9
- 5 May/05 not checked on
- 31 May/05 no visual
- 10 June/05 seen alone (no calf)
- 23 September/05 no visual
- 5 October/05 not checked on

Animal #115

- 3 March/05 collared
- 10 April/05 seen in group of 3
- 5 May/05 not checked on
- 31 May/05 seen alone (no calf)
- 10 June/05 not checked on
- 23 September/05 no visual
- 5 October/05 seen in group of 2 (no calf)

Animal #116

- 3 March/05 collared
- 10 April/05 not checked on
- 5 May/05 not checked on
- 31 May/05 seen alone (no calf)
- 10 June/05 no visual
- 23 September/05 seen in group of 3
- 5 October/05 not checked on
- 26 January/06 observed with calf in group of 7

Animal #117

- 3 March/05 collared
- 10 April/05 not checked on
- 5 May/05 not checked on
- 31 May/05 seen alone (no calf)
- 10 June/05 seen in thick brush
- 23 September/05 seen in group of at least 4
- 5 October/05 not checked on
- 26 January/06 observed with calf in group of 4